WHAT IS CLAIMED IS:

1. A method of manufacturing a light emitting diode, the method including:

depositing a plurality of semiconductor layers on a deposition substrate;

removing at least some of the deposited semiconductor layers from a selected trench region of the deposition substrate to define a light-emissive mesa;

forming an electrode on the mesa;

flip-chip bonding the mesa to a first electrical bonding pad of a thermally conductive support; and

removing the deposition substrate.

2. The method as set forth in claim **1**, further including:

subsequent to the removing of the deposition substrate, depositing a light-transmissive, electrically conductive window layer on a surface of the mesa opposite the electrode, the window layer extending laterally to electrically contact a second electrical bonding pad of the thermally conductive support to define an electrical path between the mesa and the second electrical bonding pad.

3. The method as set forth in claim **2**, further including:

prior to the depositing of a window layer, depositing an insulating material between the second electrical bonding pad and the mesa, the window layer extending laterally over the insulating material.

4. The method as set forth in claim **2**, wherein the depositing of a window layer includes:

depositing at least one window layer by liquid phase epitaxy.

5. The method as set forth in claim **2**, wherein the depositing of a window layer includes:

non-epitaxially depositing at least one window layer.

6. The method as set forth in claim **1**, wherein the removing of at least some of the deposited semiconductor layers to define a light-emissive mesa defines a plurality of mesas, and the removing of the deposition substrate effects a physical separation of the mesas wherein the mesas define a plurality of separated light emitting diode device dice in which each device die is flip-chip bonded to the thermally conductive support.

7. The method as set forth in claim **1**, wherein the removing of at least some of the deposited semiconductor layers from a selected trench region includes retaining at least one semiconductor layer that is substantially electrically conductive in the trench region, and the flip chip bonding further includes:

flip-chip bonding a second electrical bonding pad to the retained semiconductor layer in the trench region, wherein the retained semiconductor layer defines an electrical path between the mesa and the second bonding pad.

8. The method as set forth in claim **7**, further including:

prior to the flip chip-bonding, depositing an insulating material at least on sidewalls of the mesa.

9. The method as set forth in claim **7**, wherein the deposition substrate is a GaAs substrate, the plurality of semiconductor layers include group III-phosphide layers, and the retained semiconductor layer includes a layer that contains aluminum.

10. A flip-chip light emitting diode including:

a thermally conductive support structure including first and second electrical pads arranged on a surface of the support structure for delivering electrical power;

a plurality of light-generating semiconductor layers defining a light-emissive mesa electrically contacting the first electrical pad; and

a window layer disposed over the light-emissive mesa and the second electrical pad, the window layer electrically contacting the second electrical pad, the window layer being light-transmissive with respect to light generated by the light-generating semiconductor layers, the window layer further being electrically conductive to define a current-spreading electrical path between the light-emissive mesa and the second electrical pad.

11. The flip chip light emitting diode as set forth in claim **10**, further including:

an insulator disposed between the mesa and the second electrical pad and electrically isolating the mesa from the second electrical pad.

12. The flip chip light emitting diode as set forth in claim **10**, wherein the window layer is not epitaxial with respect to the light-emissive mesa.

13. The flip chip light emitting diode as set forth in claim **10**, wherein the window layer includes an indium tin oxide layer disposed over the light-emissive mesa and the second electrical pad.

14. The flip chip light emitting diode as set forth in claim **10**, wherein the window layer has a thickness of at least 2 microns.

15. The flip chip light emitting diode as set forth in claim **10**, wherein the light-generating semiconductor layers include epitaxially deposited layers.

16. The flip chip light emitting diode as set forth in claim **10**, wherein the window layer directly contacts an encapsulant disposed over the window layer.

17. The flip chip light emitting diode as set forth in claim **10**, wherein the window layer is exposed to air.

18. A method of manufacturing a flip-chip light emitting diode, the method including:

epitaxially depositing semiconductor layers that define a light emitting electrical junction on a principle surface of an epitaxy substrate;

forming a light-emitting device mesa from the epitaxially deposited semiconductor layers;

forming a first electrode on a portion of the device mesa distal from the epitaxy substrate, the first electrode electrically contacting the device mesa;

disposing a second electrode on the principle surface of the substrate;

flip-chip bonding first and second electrodes to bonding pads;

removing the epitaxy substrate; and

arranging an electrically conductive, light-transmissive window layer over the device mesa and the second electrode, the window layer forming an electrical connection between the device mesa and the second electrode.

19. The method as set forth in claim **18**, wherein the arranging of the window layer includes:

depositing the window layer adjacent to the epitaxy substrate during the epitaxial depositing of the semiconductor layers.

20. The method as set forth in claim **19**, wherein the disposing of a second electrode on the principle surface of the substrate includes:

forming the second electrode on the window layer, the second electrode electrically contacting the window layer.

21. The method as set forth in claim **19**, wherein the removing of the epitaxy substrate includes:

etching the epitaxy substrate, wherein the window layer provides an etch stop for the chemical removing.

22. The method as set forth in claim **18**, wherein the arranging of the window layer includes:

subsequent to the removing of the epitaxy substrate, depositing the window layer over the device mesa and the second electrode.

23. The method as set forth in claim **18**, wherein the removing of the epitaxy substrate includes:

etching the epitaxy substrate using one of wet chemical etching and plasma etching.